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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,808	09/17/2003	Denis Penninckx	Q76741	4036

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EXAMINER	
LEUNG, WAI LUN	
ART UNIT	**PAPER NUMBER**
2613	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/663,808	Applicant(s) PENNINCKX ET AL.	
	Examiner Danny Wai Lun Leung	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _20 December 2006_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-10_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-10_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _09172003_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4, and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamada et al.** *(US007058303B2)*, in view of **Harada et al.** *(Hierarchical optical path cross-connect systems for large scale WDM networks)*.

Regarding claim 1, **Yamada** discloses an optical cross-connect unit of multigranular architecture *(fig 8)* comprising:

a first stage *(upper portions of fig 8)* for switching wavelength groups *(M wavelength groups)*, the first stage comprising:

a first switching optical matrix *(2, 7-1 ... 7-M, fig 8)* for switching wavelength groups and having a plurality of input switch ports *(ports for signals 6-1, fig 8)*, a plurality of output switch ports *(8-1, fig 8)*, a plurality of input redirection ports *(ports on lower right of matrix 7-1)*, and a plurality of output redirection ports *(ports for signals 9-1, fig 8)*, a first demultiplexer means *(5, fig 8) having outputs connected to input switch ports of the first matrix (col 7, ln 7-22)*, a first multiplexer means *(13, fig 8)* having inputs connected to output switch ports of the first switching optical matrix *(col 7, ln 33-42)*.

a second stage *(lower portions of fig 8)* for switching wavelengths, the second stage comprising:

a second switching optical matrix for switching wavelengths *(33-1-1...33-1-M', fig 8)* and having input switch ports *(32-1-1, fig 8)* and output switch ports *(34-1-1, fig 8)*,

second demultiplexer means *(31-1, fig 8)* for demultiplexing wavelengths and having a plurality of inputs and a plurality of outputs, each input being connected to a distinct one of output redirection ports of the first switching optical matrix and each output being connected to a distinct input switch ports of the second switching optical matrix *(col 10, ln 30-40)*, and

second multiplexer means *(39-1-1, fig 8)* for multiplexing wavelengths and having a plurality of inputs and a plurality of outputs, each input being connected to a distinct one of the output switch ports of the second switching optical matrix and each output being connected to a distinct input redirection port of the first switching optical matrix *(col 10, ln 51-60)*,

wherein the first switching optical matrix includes a series of first optical switching submatrices *(2, 7-1..., fig 8)* and the second switching optical matrix includes a series of second switching submatrices *(33-1-1...33-1-M', fig 8)*

Yamada does not disclose expressly wherein the wavelength groups in the first stage associates with a distinct wavelength bands, and wherein the first demultiplexer means for demultiplexing wavelength bands and having p groups of n outputs associated with n distinct wavelength bands, each output being connected to a distinct one of the input switch ports of the first matrix, and the first multiplexer means for multiplexing wavelength bands and having p groups of n inputs each connected to a distinct one of the output switch port of the first switching optical matrix. **Harada**, from the same field of endeavor, teaches associating each wavelength

groups with a distinct wavelength bands *(p356, paragraph 1)*, and wherein having a first demultiplexer means for demultiplexing wavelength bands and having p groups of n outputs associated with n distinct wavelength bands, each output being connected to a distinct one of a input switch ports of the first matrix, and a first multiplexer means for multiplexing wavelength bands and having p groups of n inputs each connected to a distinct one of the output switch port of the first switching optical matrix *(fig 2)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to associate each of **Yamada's** wavelength groups with a distinct wavelength bands, and having the first demultiplexer means for demultiplexing wavelength bands and having p groups of n outputs associated with n distinct wavelength bands, each output being connected to a distinct one of the input switch ports of the first matrix, and the first multiplexer means for multiplexing wavelength bands and having p groups of n inputs each connected to a distinct one of the output switch port of the first switching optical matrix as taught by **Harada**. The motivation for doing so would have been to reduce complexity and size of OPXC, as suggested by **Harada**.

As to claim 2, **Yamada** further teaches wherein there are a number n of said first optical switching submatrices; each of said first optical switching submatrices dedicated to a distinct one of said n wavelength bands and including p of said input switch ports and p of said output switch ports, wherein n is greater than or equal to 2, and wherein each of said first optical switching submatrices includes at least one distinct input redirection port and at least one distinct output redirection port, and is coupled to a distinct one of said second switching submatrices *(as illustrated in fig 8; also described in col 7, ln 7-32)*.

As to claim 3, **Yamada** further teaches wherein each of at least two of the second submatrices comprises at least one inter-input-matrix communications port and at least one inter-output-matrix communications port, and each of the inter-input-matrix communications ports is configured to receive an information carrier signal from one of said second optical switching submatrices and each of the inter-output-matrix communications ports is configured to deliver an information carrier signal addressed to one of said second optical switching submatrices *(col 10, ln 31-64.*

As to claim 4, **Yamada** further teaches the optical cross-connect unit according to claim 3, further comprising intermatrix switching means *(37-1-1 ..., fig 8)* for coupling all of said inter-input-matrix communications ports to all of said inter-output-matrix communications ports *(col 10, ln 41-60).*

As to claim 6, **Yamada** further teaches wherein the information carrier signals are optical signals and the intermatrix switching means comprises wavelength conversion means *(col 9, ln 50-56).*

As to claim 8, **Yamada** further teaches wherein said second switching submatrices comprise electrical *(electric switch 22, fig 7; col 9, ln 57-65)* and optical-electrical converters *(receivers 21, fig 7)* and electrical-optical converters *(transmitters 23, fig 7)* are respectively connected to the input switch ports and the output switch ports of said second switching submatrices *(col 9, ln 57-65).*

As to claim 7, **Yamada** further teaches the optical cross-connect unit according to claim 1, further comprising wavelength conversion means *(wavelength converter 23, fig 7; col 9, ln 51-*

64) disposed between output switch ports of the second switching submatrices *(output ports of switch 22, as shown in fig 7)* and the second multiplexer means *(12-1, fig 7).*

3. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamada et al.** *(US007058303B2)*, in view of **Harada et al.** *(Hierarchical optical path cross-connect systems for large scale WDM networks)*, as applied to claim 4 above, and further in view of **Wang et al.** *(US 20030185565A1).*

Regarding claims 5 and 9, **the combination of Yamada and Harada** discloses the apparatus in accordance to claims 4 and 1 as discussed above. **Yamada** further teaches wherein the information carrier signals are optical signals *(col 7, ln 7-14).* **The combination of Yamada and Harada** does not disclose expressly wherein the optical cross-connect unit further comprises an optical concentrator for concentrating optical signals coupling all of the inter-output-matrix communications ports to the inputs of the intermatrix switching means and an optical deconcentrator for deconcentrating optical signals coupling outputs of the intermatrix communications means to all of the inter-input-matrix communications ports.

Wang, from the same field of endeavor, teaches an optical cross connect system comprising an optical concentrator for concentrating optical signals coupling all of the inter-output-matrix communications ports to the inputs of the intermatrix switching means and an optical deconcentrator for deconcentrating optical signals coupling outputs of the intermatrix communications means to all of the inter-input-matrix communications ports *(fig 4).* Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to use concentrators and deconcentrator onto **the combination of Yamada and Harada**'s system as

suggested by **Wang**. The motivation for doing so would have been to enhance cost-performance *(paragraphs 11-12, Wang)*.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamada et al.** *(US007058303B2)*, in view of **Harada et al.** *(Hierarchical optical path cross-connect systems for large scale WDM networks), as applied to claim 7 above,* and further in view of **Iannone et al.** *(US006792207B2)*.

Regarding claim 10, **the combination of Yamada and Harada** discloses the apparatus in accordance to claim 7 as discussed above. **It** does not disclose expressly wherein the information carrier signals are optical digital signals, and the optical cross-connect unit further comprises 3R regenerators. **Iannone**, from the same field of endeavor, teaches a cross-connect unit wherein the information carrier signals are optical digital signals *(col 2, ln 2-23)*, and the optical cross-connect unit further comprises 3R regenerators *(225, 230, 240, 245, fig 2)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to use 3R regenerators when the information carrier signals are optical digital signals as wavelength conversion means onto **the combination of Yamada and Harada's** system as taught by **Iannone**. The motivation for doing so would have been to make large network opaque with respect to carrier wavelengths, in order to improve phase performance, amplification, and switching in the optical domain as suggested by **Iannone** *(col 2, ln 10-15)*.

Response to Arguments

5. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

7. Prior art made of record in previous action(s) and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Danny Wai Lun Leung whose telephone number is (571) 272-5504. The examiner can normally be reached on 9:30am-9:00pm Mon-Thur.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DWL
February 28, 2007

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